COMMONWEALTH OF VIRGINIA

FY 2006 – 2007
PROJECT APPLICATION FORM

Date (mm/dd/yyyy): 07/01/2007

Use TAB KEY to reach each field.

Instructions for completing each field appear on the status bar at the bottom of the active window. Press F1 for additional help.

A. Applicant (Group, Agency, etc.)	Name:	Virginia Department of Historic Resources	
	Address:	2801 Kensington Avenue	
	City, State Zip	Richmond, VA 23221	
	Telephone:	804-367-2323	
	Email Address:	kathleen.kilpatrick@dhr.virginia.gov	
B. Project Sponsor (if different from A.) Name and Address	Name:		
	Address:		
	City, State Zip		
	Telephone:		
	Email Address:		
C. Responsible Person/Title – Sponsor:	Name:	Kathleen S. Kilpatrick.	
	Telephone:	804-367-2323, ext.128	Fax: 804-367-2391
	Email:	kathleen.kilpatrick@dhr.virginia.gov	
D. Project Manager:	Name:	Christopher M. Stevenson, Ph.D.	
	Telephone:	804-367-2323, ext 132	Fax: 804-367-2972
	Email:	christopher.stevenson@dhr.virginia.gov	

E. Project Title:	Reconstructing Ancient Native American Transportation Routes Through Jasper Trace Element Chemistry

F. Project Description**:**

Purpose:

It is the goal of this project to look at ancient transportation routes within Virginia and the larger Middle Atlantic Region between 10,000 BC and AD 1600. During this long period, hunter-gather groups, and after AD 1100 farming societies, traveled to obtain food resources and to exchange pelts, tools, and marriage partners with other groups. Some of these excursions are believed to have occurred over long distances, especially in the early exploration and settlement of the North American continent by Native Americans. A significant debate currently exists over the geographic distance that was traveled by foraging groups (Tankersley 1989; McAvoy 1992; Anderson 1995; Anderson and Gillam 2000) and a resolution to this discussion hinges upon the ability to track the movement of past peoples. This is a difficult task because the remains of past settlements often consist of highly similar artifacts. However, the wide dispersal of projectile points and other artifacts made from jasper derived from chemically distinct regions makes it possible to trace the movement of ancient peoples (See Attachment E). By linking prehistoric artifacts found on the landscape to the quarries at which they were manufactured, the ranges and routes of past peoples can be reconstructed.

An indicator, or proxy measure, of human transport and travel in the past cannot rely on the scant hope of finding past earthen trails. The written accounts of the early explorers who came in contact with the Native Americans documented the early trail systems. However, even if the contact period trails have great antiquity, the original network would have evolved and changed as the sea level rose, as resource locations changed, and as populations grew and occupied distinct territories. A useful tool in the reconstruction of the very early trails and home ranges are the locations of archaeological habitation sites which represent moments in time along the path of travel. Discarded artifacts, or prehistoric trash, located at these sites that was originally acquired before arrival can pinpoint the direction from which the

group came. Jasper is one such disposed artifact that has a variety of chemical signatures that can be used to reconstruct human mobility patterns.

We intend to focus this research on the regionally important Brook Run Site (44CU122), a large and rich jasper quarry previously excavated and reported by VDOT. The Paleoindian and Early Archaic Periods have produced evidence of high mobility based upon occurrence of "exotic" non-jasper lithics recovered at far distances from the source, and one infers from their presence that the Brook Run jasper was also widely distributed. However, this has not been confirmed through quantitative geochemistry. Recent neutron activation analysis (NAA) analysis has defined the Brook Run Site as a distinct chemical source compared to several other jasper quarries in Virginia (e.g. Flint Run, Arnold's Valley), and, based upon the vast quantities of high quality reduction debris, a deposit that was extensively used in prehistory (See Attachments E and F). However, a proper evaluation of the use and transport of quarry materials requires that the chemical signatures of all regional jasper sources be thoroughly documented. With a comprehensive inventory of all jasper sources we will able to identify those artifacts specific to Brook Run and contribute substantially to the issues of prehistoric mobility.

Methodology:

In this proposed research we build upon a series of previous VDOT and academic studies that have established the method to link jasper artifacts to their points of origin. Using NAA we will complete the chemcial analysis of 15 jasper quarries (450 samples). This will cover the analysis of all known jasper quarries in the Eastern United States (and one in Canada) (See Attachment E: Table 1) and establish a highly precise reference base line for the identification of remotely located jasper artifacts. The second part of our proposed study will be to analyze 400 cultural artifacts by laser ablation-inductively coupled plasma- mass spectrometry (LA-ICP-MS) from excavated archaeological sites of known age to reconstruct past transporation routes. Eighty of these samples will be from archaeological sites along the eastern seaboard to evaluate models of long distance human movement. The remaining 320 samples will be from archaeological sites in Virginia that will be used to examine human movement patterns on a smaller scale (0-300 miles) during later time periods. LA-ICP-MS is a minimally-destructive form of analysis that will permit flakes and formal tools to be sampled without visible damage. It will not be used in the initial characterization of sources because the precision is slightly less than NAA. A cross-calibration between the two methods with identical standards and dubplicate analyses of archaeological samples will ensure that the methods are comparable.

Past analyses of jasper sources has demonstrated their chemical distinctiveness and established the foundation for this proposed research. However, previous studies have used a number of analytical methods such as atomic absorption spectroscopy, x-ray fluorescence (XRF), and neutron activation analysis, with differences in element detection limits and analytical standards (Blackman 1974; Miller 1982; Stevenson et al. 1992; King et al. 1997, Monaghan et al. 2004). As a result, there is not a comprehensive data base produced by one method. This prevents the study of regional patterns of population movement and exchange in prehistory. Our proposed investigations will overcome this limitation and result in a usable reference database.

Many of the geological reference materials to be used for NAA analysis will be obtained from existing collections at DHR and the Pennsylvania State University (PSU). It will be necessary to conduct field trips to obtain samples from eight additional quarries that were not sampled or only minimally sampled in previous research. These include the Maine, Vermont, Nova Scotia and a newly discovered central Pennsylvania source location.

The archaeological samples to be studied in this work will come from curated collections of previously excavated archaeological sites. These collections are housed at DHR, The College of William and Mary (W&M), and Penn State University. PSU has agreed to lend the 80 samples from the US eastern seaboard locations as well as source materials from three central Pennsylvania quarries. The Virginia samples will come from existing VDOT generated collections housed at W&M and DHR that have accumulated over the last 20 years. Samples will be taken from dated archaeological contexts or time sensitive artifacts (e.g., projectile points) of the five recognized prehistoric periods (Paleo-indian, Archaic, Early Woodland, Middle Woodland, Late Woodland) and 80 samples from each period will be selected. An effort will be made to select sites located close to (0-30 miles) and far away from (30-200 miles) jasper source locations.

G. Transportation Enhancement Categories (Check all that apply – See Enhancement brochure for details of categories)

1. ☐ Bicycle and Pedestrian Facilities
2. ☐ Bicycle and Pedestrian Safety and Educational Activities
3. ☒ Scenic Easements and Scenic or Historic Sites
4. ☐ Scenic or Historic Highway Program
5. ☐ Landscaping and Other Scenic Beautification
6. ☒ Historic Preservation
7. ☐ Rehabilitation and Operation of Historic Transportation Building, Structures, or Facilities
8. ☐ Preservation of Abandoned Railway Corridor
9. ☐ Control and Removal of Outdoor Advertising
10. ☒ Archaeological Planning and Research
11. ☐ Mitigation of Pollution Due to Highway Run-off and Wildlife Protection
12. ☐ Establish Transportation Museum

H. Critical Milestone Dates and Endorsements (Attach copy of the public notice and all resolutions endorsing the project)	
a. Public Hearing	
b. Local Government Endorsement	
c. MPO Resolution Endorsement	☒ Check if not applicable

I. Federal Enhancement Funds Requested in this Application **Do not include any previous allocations or future phases!**	(**Maximum 80% Project Cost.)**	$78,000.00

J. Match Required	(**Minimum 20% of Project Cost)**	$15,600.00

K. Match Breakdown by Source (include value of in-kind/donations)	Status (check appropriate status)	Amount
Salary-Lewis-Grant financial management	☒ Confirmed ☐ Anticipated	$2,500.00
Salary-Stevenson-Project management, sample collection, data analysis, publication preparation	☒ Confirmed ☐ Anticipated	$9,853.00
Salary-Meyers-Assistance with exhibit development	☒ Confirmed ☐ Anticipated	$3,500.00
	☐ Confirmed ☐ Anticipated	

L. Other Funding Sources Available (beyond match requirement)	Status (check appropriate status)	Amount
Previous funding contributed by DHR for this project	☒ Confirmed ☐ Anticipated	$9,000.00
	☐ Confirmed ☐ Anticipated	

M. Relationship to a Previously Funded Enhancement Project	None

N. Project Budget: **Attach Complete Budget Projection including design, land acquisition, utility relocations, and construction costs – if project includes multiple phases, separate budget by phases. Budget Projection should be a total project cost including federal and non-federal funds.**

O. Project Budget Summary (summarize for each phase)		
a.	Preliminary Engineering (planning and design)	$0.00
b.	Right–of–way (land acquisition/easements)	$0.00
c.	Utility Relocation	$0.00
d.	Construction/Implementation	$0.00
e.	TOTAL	$0.00

P. Ownership (Who will own/maintain the completed project?)	The completed project will be published in the public record and the raw data, notes and samples will be placed in the public archives at DHR.

Q. Selection Criteria: **Complete Attachment A** –Include pictures, maps and support documents. Attach additional sheets if needed.

R. Sponsor Signature (person responsible) Date

MAILING ADDRESS AND TECHNICAL ASSISTANCE

Please mail FIVE copies of your completed application package to the following address:

Mr. Michael A. Estes
Local Assistance Division
Virginia Department of Transportation
1401 East Broad Street
Richmond, Virginia 23219

For Technical Assistance Contact:

Winky Chenault	(804) 786-2264	Toll Free:	(800) 444-7832
Pamela Liston	(804) 786-2734	Fax:	(804) 786-2603
Erica Jeter	(804) 786-9125		
Cynthia Clark	(804) 371-6289		

http://www.virginiadot.org

COMMONWEALTH OF VIRGINIA

FY 2006 – 2007
ATTACHMENT A
SELECTION CRITERIA

THIS FORM MUST BE COMPLETED BY ALL APPLICANTS

Date: _____

A. Applicant (Group, Agency, etc.)

Name: Virginia Department of Historic Resources
Address: 2801 Kensington Avenue
City, State Zip Richmond, VA 23221

B. Project Title: Reconstructing Ancient Transportation Routes Through Jasper Trace Element Chemistry

C. Complete the following questions providing as much detail as possible while including examples when available. Responses will automatically expand to additional sheets as needed.

1. Relationship to Transportation – What service or function will this project, or has this project, provided for the traveling public? How will it impact transportation?

This project will contribute directly to Category 10: Archaeological Planning and Research and will focus on sites eligible for transportation funds. Two areas are addressed by this project:

a) Planning to improve identification, evaluation and treatment: Understanding the significance of prehistoric lithic sites is key to their management during the planning process for Federal, State, and local projects. The evaluation of archaeological sites to determine if they are eligible for the National Register of Historic Places (NR) relies heavily on the potential of a site to contribute to the historic knowledge base. Making this assessment is much easier and valid if the universe of objects is well-defined. The chemical analysis of jaspers is one such area that will broaden the knowledge base and strengthen the planning process. For example, what is the significance of jasper artifacts found at a Native American village dating to AD 1400? Without detailed jasper source data, the site would appear to have little potential to contribute new information and would likely be considered not eligible for the NR. This conclusion, however, may not be accurate and result in flawed management recommendations. A chemical analysis of the site samples compared to known sources could determine if the artifacts were locally acquired or came from a remote source. With more complete information available, the site could be more accurately evaluated and those sites that represent a rare and significant link in the trading system of this period would not go unrecognized.

b) Problem oriented systhesis that uses transportation related projects: This project is an attempt to summarize the regional use and dispersion of jasper along the east coast of North America and for Virginia in particular. The project incorporates information generated by the VDOT excavation and analysis of the Brook Run jasper quarry and will analyze additional specimens to more fully understand the quarry chemistry. In addition, project will take advantage of other numerous VDOT-related survey and testing projects where jasper has been found in the past--thus making an even greater use of previous, publicy funded research. These collections are on file at DHR and readily accessible. In both instances, the project builds upon earlier VDOT projects using systematically collected information.

2. Demonstrated Need – What need(s) will this project fulfill within the community?

This project proposes research specifically designed to help in the evaluation of archaeological sites that fall under the mantle of Section 106 procedures. Projects that incorporate research to solve or refine specific management goals have not been funded in the past and this project provides a unique opportunity to demonstrate how the current archaeological science can improve the management of public resources.

The development of methods to interpret the archaeological record is very difficult and rigorous. These types of studies have not been traditionally funded with highway transportation funds because of their complexity and long duration. However, at this point we have a converging set of events (e.g., expertise, available specimens, instrumentation) that will allow a final integrative project to be quickly realized and one that will have a long-term value to the public. The end result of this project will be a freely available geochemical data base and methodology that can be widely used by the professional archaeological community. As such, it provides a tool that increases detail with which the archaeological record can be studied. Distributional information can help identify trade routes, the degree of interaction between communities or regions, and complement the inferences drawn from other identity markers such as ceramics. The material record of Virginia prehistory is limited in the variety of preserved technological items and the analytical utility of jasper increases the ability to interpret the past at a greater level of sophistication.

3. Project Usefulness and/or Benefit – What purpose will this project serve and how will it benefit the community? Is there strong community support?

The results will provide a direct state-wide benefit to the professional archaeological community (e.g., VDOT consultants) and assist with the development of research designs where jasper provenance studies can answer questions important to prehistory.

Archaeological provenance studies are of wide interest to the public and this is expressed by the numerous invitations we receive to speak to local and regional audiences. The results of this study will be communicated in numerous public forums such as conferences and workshops with community groups (e.g., historical societies) and professional and amateur archaeological societies.

The results of this project will be made available to the public on the DHR web page. The web content will include a comprehensive discussion and illustration of the procedures and results understandable to the lay public. In addition, an Excel spreadsheed of the source and artifact chemistry that can be downloaded by VDOT staff, consultants, and other interested parties.

4. Amenities/Support Facilities – What facilities are available and/or included in this proposal? What means of access will be available?

The DHR staff has full access to the Commonwealth archaeological collections facility, the artifacts contained within, and access to the reports and field notes associated with the collections. These collections also contain geological samples from five jasper quarries located in Virginia and North Carolina. In addition, DHR has a fully equipped conservation laboratory for sample cleaning, photodocumentation, and sample preparation.

5. Educational/Historical – Explain the history and/or scenic significance of this project. What educational experience will be provided?

This project will contribute to the understanding of prehistoric Native American patterns of travel and interaction, and ultimately to understanding what strategies were used as part of the prehistoric economy of hunter-gatherers and early farmers. As such, it explores the cultural diversity of peoples who have inhabited the Virginia terrain over the last 10,000 years and demonstrates that public funds are used in a manner that benefits the history of the descendants of these early Indian populations through an enrichment of their cultural content.

This project is inextricably linked to public education and outreach. On a program specific level, the educational component of thi project consists of four parts: 1) The project will employ a college intern who will learn laboratory procedures of

sample preparation and methods of statistical analysis; 2) A small scale traveling exhibit for display at the Prince George Regional Heritage Center, Longwood University, the Virginia Museum of Natural History, and other venues, will be one end product of this research; 3) In addition, presentations will be made at regional archaeological meetings of the Archaeological Society of Virginia and the Middle Atlantic Archaeological Conference; 4) Publication will occur in a professional journal such as Journal of Archaeological Science.

In this way, as an educational tool, this project is integral to historic preservation, heritage tourism, and resource management--essential aspects of community development that contribute to the Commonwealth's overall prosperity and positive quality-of-life attributes.

6. Project Resources – How has the community involved itself in this project? What support has been provided? Has funding and/or land been secured? Is this a continuation of an existing project, and if so, what is the status of that project?

The Archaeological Society of Virginia, the US Forest Service (Roanoke), and private property owners have all assisted in locating and granting access to jasper quarries. Commonwealth institutions and universities will also provide access to artifacts for analysis. A pilot study for this project has been funded by the DHR Threatened Sites Program and internal research funding from 2003-2007 and has brought the project to a 30% completion. No additional external funding has been secured since that time. DHR will contribute additional resources in the form of salary, use of the conservation laboratory, and use of a vehicle required for the collection of additional samples.

D. If this project has received Enhancement funds in prior years, complete the following:

Enhancement Award by Year (include Federal Enhancement funds only, do not include applicant match or other non-federal participation). Identify if the award was applied to a prior phase of a multi-phased project.

Year	Award	Applied Toward/Phase
1993		
1994		
1995		
1996		
1997		
1998		
1999		
2000		
2001		
2002		
2003		
2004		
2005		
Total	$0.00	